MEMORANDUM

TO:	Adam Ulrich, PE Transportation Engineer Specialist Division of Highway Design	CC:	T. Lovell S. Tipton B. Kidd
FROM:	Adam Ross, PE Geotechnical Services Branch Manager Division of Structural Design		T. Owens (Qk4) C. Davis (Qk4) T. Kelly (Qk4)
BY:	Tyler Sheffield, PE Geotechnical Services Branch		
DATE:	April 3, 2024		
SUBJECT:	Franklin County I-64 WB Ramps to US 127 Ramp G Station 13+00 to 30+44.61 Ramp FF Station 18+84.87 to 28+83.24 Item # 5-80212.00 Mars # 15005701D Project # 1100 FD52 037 0000 000-000D Geotechnical Engineering Roadway Report		

Location and Description

An abbreviated geotechnical engineering report has been completed for the subject project. The purpose of this project is to provide new ramps from I-64 WB to US 127 to reduce congestions. The drilling and sampling were performed by a KYTC Geotechnical drill crew. The laboratory testing was performed by the KYTC Geotechnical Office. The purpose of this report is to identify potential geotechnical concerns based on the subsurface information obtained, a review of the project plans, the drilling, and prior experience with the project area. Reduced size geotechnical symbols, notes, profile, and embankment stability sheets are attached. The CADD input, in DGN format, is being e-mailed to the district and design consultant, Qk4, for incorporation into the roadway plans.

Geology

The proposed roadway alignment is located along the eastern edge of the Frankfort West Geologic 7.5-minute Quadrangle (GQ-1221). Geologic mapping indicates the alignment to be underlain by the Lexington Limestone and Clays Ferry Formation.

Based on project geometry, an insufficient amount of rock from roadway excavation will be available for rock roadbed construction. Therefore, other means of subgrade stabilization will be recommended.

Drilling and Sampling

Drilling operations for this project were performed in March of 2024. The drilling operations consisted of 4 embankment stability borings, 6 profile borings, and 2 pavement core borings. Boring depths ranged from 0.3 to 33.7 feet. Of the 12 borings, 10 met refusal. When encountered, the refusal depth varied from 0.3 to 33.7 feet. As expected, the refusal lithology was limestone.

Laboratory Testing

Soil testing for the project showed the most common soil types for the project to be lean clay and clayey gravel (CL and GC in the Unified Soil Classification System).

Three Resilient Modulus tests were performed on samples obtained from soils at the proposed cuts and near the proposed subgrade. The results of the testing ranged from 6,300 psi to 12,400 psi with an average of 9,400 psi.

Engineering Analysis

Stability analyses were required for this project based on the slope heights and configurations. Based on the current slope configurations shown in the cross-sections, the construction of the embankments using material from roadway excavation and offsite borrow location should meet the required safety factors unless otherwise noted. All embankment side slopes shall be designed 2H:1V or flatter unless otherwise noted. All soil cut slopes should be 2H:1V or flatter and should be constructed according to the current edition of the Standard Specifications for Road and Bridge Construction.

Soil Stabilization

Based on review of the drilling for the project, it appears durable rock will not be of sufficient quantity to construct a rock roadbed. Chemical stabilization may not be viable for this project given the location, project geometry, and maintenance of traffic concerns. The project team has chosen to construct a mechanically stabilized roadbed using 6 inches of additional aggregate base (DGA or CSB) underlain with High Strength Geotextile Fabric Class 1A between the aggregate and the soil subgrade.

Subgrade problems may occur in areas where the existing pavement will be removed or where the roadway template is in a shallow fill or in a cut condition. Therefore, thickening of the aggregate base stabilization or a 2-foot working platform consisting of Kentucky Coarse Aggregate No. 2's, 3's, or 23's underlain with Class 1 Geotextile Fabric (Stabilization) may be required for these areas. The thickness of the working platform may need to be greater than two feet in areas as determined by the Engineer on construction and may depend on seasonal fluctuations in the water table. The working platform shall daylight horizontally to the edge of embankment in fills and to the ditchline in cuts, to ensure positive drainage. For quantity estimation purposes only, a 2-foot working platform for 200 linear feet of roadway may be assumed.

The embankment foundation construction may require a working platform where soft and/or saturated soils are encountered. The extent of these problems will depend on weather conditions during embankment construction and seasonal water table fluctuations. The recommendations below provide for the use of Non-Erodible Granular Embankment underlain with Fabric-Geotextile Class 2 (Separation) for any such wet areas encountered during construction. For quantity estimation purposes only, a 2-foot embankment working platform for 200 linear feet of roadway may be assumed.

GEOTECHNICAL RECOMMENDATIONS:

- 1.) In accordance with Section 206 of the current Standard Specifications, the moisture content of embankment material shall not vary from the optimum moisture content as determined by the current version of KM 64-511 by more than +2 percent or less than -2 percent. This moisture content requirement shall have equal weight with the density requirement when determining the acceptability of embankment construction. Refer to the Family of Curves for moisture/density correlation.
- **2.)** All soils, whether from roadway or borrow, may require manipulation to obtain proper moisture content prior to compaction. Direct payment shall not be permitted for rehandling, hauling, stockpiling, and/or manipulating soils.
- **3.)** Excavation of surface ditches and channel changes adjacent to embankment areas shall be performed prior to the placement of the adjacent embankments. The material excavated for the channel changes and surface ditches is suitable for embankment construction if dried to proper moisture content in accordance with Section 206 of the current Standard Specifications for Road and Bridge Construction.
- **4.)** The Contractor is responsible for conducting any operations necessary to excavate the cut areas to the required typical section. These operations shall be incidental to Roadway Excavation or Embankment-in-Place and no additional compensation shall be made for this work.
- 5.) Some of the soil horizons and slopes on the project are subject to erosion. Necessary procedures in accordance with Sections 212 and 213 of the current Standard Specifications for Road and Bridge Construction shall be followed on construction.
- 6.) Removal of existing structures and other obstructions shall be completed in accordance with Section 203 of the current Standard Specifications for Road and Bridge Construction.
- 7.) Clearing and grubbing of roadway areas shall be completed in accordance with the requirements of Section 202 of the current Standard Specifications for Road and Bridge Construction before embankment placement.
- 8.) Borrow material, if required for subgrade, shall meet the minimum CBR value of 3.
- 9.) Foundation embankment benches shall be constructed in accordance with Standard

Drawing RGX-010 at the locations listed below and/or as directed by the Engineer. Contrary to Standard Drawing RGX-010, the typical rise height for benching into soil/earth slopes shall be 4 to 6 feet. Benches in soil/earth slopes shall be constructed one at a time beginning with the lowest bench and each bench shall be backfilled prior to excavation of the next bench.

<u>US 127</u> 118+75 to 123+00, Right

<u>Ramp G</u>

Station 18+75 to 19+75, Left Station 24+75 to 26+75, Both Sides

- 10.) If groundwater is encountered during construction of embankment benches, construct a trench underdrain in accordance with Standard Drawing RDP-006 Detail B, except the trench shall have a minimum 2 ft. X 2 ft. cross-section and shall be placed in both soil or bedrock benches. The trench backfill shall consist of Kentucky Coarse Aggregate No. 2 in accordance with Section 805 of the current Standard Specifications or other durable, non-erodible material deemed suitable by the Engineer. The rock trench shall be graded to allow for positive drainage. The rock trench shall be wrapped in Fabric-Geotextile Class 2 (Subsurface Drainage) in accordance with Sections 214 and 843 of the current Standard Specifications. Contrary to Standard Drawing RDP-006, outlet underdrains (perpendicular to the roadway) shall follow Detail B with the same backfill and fabric materials given above. Spacing of outlet underdrains shall be approximately 300 ft along the roadway, or as directed by the Engineer.
- **11.)** Perforated pipe for subgrade drainage shall be placed in vertical sags and cut to fill transitions in accordance with KY Standard Drawing RDP-005 at the following approximate locations and/or where designated by the Engineer.

Ramp G Station 26+78

Ramp FF Station 22+57

12.) Transverse benching shall be installed at the following approximate locations in accordance with Standard Drawing RDP-006 and any others designated by the Engineer.

Ramp G

Station 24+80 to 26+78

13.) In areas where pavement is not to be overlaid, existing bituminous concrete located at a distance less than three feet below the proposed subgrade elevation within the limits of new roadway embankments, shall be removed entirely. This shall be performed in compliance with Section 206 of the Standard Specifications for Road and Bridge Construction.

- 14.) As directed by the Engineer, existing bituminous concrete located at a distance greater than three feet below the proposed subgrade elevation within the limits of new roadway embankments, shall be scarified or broken until all cleavage planes are destroyed, or the pavement shall be removed entirely as conditions demand. This shall be performed in compliance with Section 206 of the Standard Specifications for Road and Bridge Construction.
- **15.)** In order to provide a working platform for embankment construction, Non-Erodible Granular Embankment in accordance with the current edition of Section 805 of the Standard Specifications for Road and Bridge Construction shall be placed over all soft and/or saturated areas that may be detected during construction, as directed by the Engineer. The required thickness is estimated to be 2 foot, but the actual locations and thickness shall be determined by the Engineer during construction and may depend on seasonal fluctuations in the water table. This material shall be wrapped with Geotextile Fabric Class 2 (Separation) in accordance with Sections 214 and 843 of the Standard Specifications for Road and Bridge Construction, current edition.
- 16.) Construct a mechanically stabilized roadbed using 6 inches of aggregate base (DGA or CSB) underlain with High Strength Geotextile Fabric Class 1A between the aggregate and the soil subgrade. Where soft and/or wet subgrade is encountered during construction, the thickness of the stabilization may be increased or a 2-foot working platform consisting of Kentucky Coarse Aggregate No. 2's, 3's, or 23's underlain with Class 1 Geotextile Fabric (Stabilization). These adjustments shall be as directed by the Engineer.
- **17.)** Where durable rock is encountered at the top of subgrade, the bedrock should be undercut to accommodate the 6 inches of mechanical stabilization.

DESIGN RECOMMENDATIONS:

- 1.) This project should be designed for a 2-foot soil subgrade with a CBR design value of 3.
- **2.)** An average soil shrinkage value of two (2) percent is estimated for this project. This value should be applied to the formula for calculating the Apparent Shrinkage as outlined in the Design Manual.
- cc: Division of Design (Plan Processing Section) TEBM for Pavement Design Division of Construction TEBM for Project Delivery & Preservation (District) TEBM for Project Development (District) Project Manager (District) Design Consultant (QK4)

Attachments:

SITE MAP



AASHTO Classification of Soils and Soil-Aggregate Mixtures

General Classification			Granular Materials (35% or less passing 0.075 mm)					Silt-Clay Materials (More than 35% passing 0.075 mm)			
Group Classification	A	-1		A-2				Δ 4			A-7
	A-1-a	A-1-b	A-3	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7-5 A-7-6
Sieve Analysis, Percent Passing 2.00 mm (No. 10) 0.425 mm (No. 40) 0.075 mm (No. 200)	50 max 30 max 15 max	 50 max 25 max	 51 min 10 max	 35 max	 35 max	 35 max	 35 max	 36 min	 36 min	 36 min	 36 min
Characteristics of Fraction Passing 0.425 mm (No. 40) Liquid Limit Plasticity Index	 6 n	 6 max		40 max 10 max	41 min 10 max	40 max 11 min	41 min 11 min	40 max 10 max	41 min 10 max	40 max 11 min	41 min 11 min

MAJOR DI	VISIONS	SY	MBOL	NAME	
		GW		Well-graded gravels or gravel-sand mixtures, little or no fines.	
	GRAVEL AND	GP	 	Poorly graded gravels or gravel-sand mixtures little or no fines.	
	GRAVELLY SOILS	GM		Silty gravels,gravel-sand-silt mixtures.	
COARSE		GC		Clayey gravels,gravel-sand-clay mixtures.	
SOILS	SAND AND	SW		Well graded sands or gravelly sands, little or no fines.	
		SP	* *	Poorly graded sands or gravelly sands, little or no fines.	
	SANDY SOILS	SM	Silty sands,sand-silt mixtures.		
		SC Clayey sands, sand-clay mixtures.		Clayey sands,sand-clay mixtures.	
	SILTS	ML		Inorganic silts and very fine sands,rock flour, silty or clayey fine sands or clayey silts with slight plasticity.	
	AND CLAYS LL IS LESS	CL		Inorganic clays of low to medium plasticity, gravelly clays,sandy clays silty clays, lean clays.	
FINE GRAINED SOILS	THAN 50	ML-CL		Silty clay-silty clay with sand and or gravel, sandy silty clay, sandy silty clay with gravel, gravelly silty clay, gravelly silty clay with sand	
	SILTS AND CLAYS	MH		Inorganic silts,micaceous or diatomaceous fine sandy or silty soils,elastic silts.	
	LL IS GREATER THAN 50	СН		Inorganic clays of high plasticity,fat clays.	
				REVISION	

Unified Soil Classifications

GEOTECHNICAL SYMBOLS

Al	Activity Index
LI	Liquidity Index
S+C	Silt + Clay (% finer than No.200 Sieve)
\bigcirc	Rockline Soundings
\bullet	Disturbed Sample Boring
\bigcirc	Undisturbed Sample Boring
lacksquare	Undisturbed Sample Boring & Rock Core
	Rock Core
-(_')-	Slope Inclinometer Installation typical applications:
OW	Observation Well
	Approximate Footing Elevation
_ ▼ (Date)	Water Elevation

Unified Soil Classifications - Continued

	MAJOR DI\	/ISIONS	SYN	IBOL	NAME					
			GP-GC		Poorly graded gravel with clay (or silty clay), poorly graded gravel with clay and sand (or silty clay & sand)					
		GRAVEL	GP-GM		Poorly graded gravel with silt, poorly graded gravel with silt and sand					
		AND GRAVELLY SOILS	GW-GC		Well graded gravel with clay (or silty clay), well graded gravel with clay and sand (or silty clay and sand)					
			GW-GM		Well graded gravel with silt, well graded gravel with silt and sand					
	COARSE GRAINED SOILS		GC-GM		Silty clayey gravel, silty clayey gravel with sand					
			SW-SC	0 0 0	Well graded sand with clay (or silty clay), well graded sand with clay and gravel (or silty clay & gravel)					
		SAND	SP-SC		Poorly graded sand with clay (or silty clay), poorly graded sand with clay and gravel (or silty clay and gravel)					
		AND SANDY SOILS	SP-SM Poorly graded sand with silt, poorly graded sand with silt and gravel							
			SC-SM	SM Silty clayey sand, silty clayey sand with gravel						
			SW-SM		Well graded sand with silt, well graded sand with silt and gravel					
	UNCLAS	SIFIED	ОН		Organic (High Plasticity)					
	MATE	MATERIAL			Organic (Low Plasticity)					
DATE		PREPA	RED BY		DATE: CHECKED BY					
	Divisio	on of Struc	tural De	sign	DESIGNED BY:	╞				
	Geotechnical Branch				DETAILED BY:					

VS (psf)	Field Vane Shear Strength
	Thin-walled Tube Sample
<	Standard Penetration Test Sample
Ν	Penetration Resistance
Qu (psf)	Unconfined Compressive Strength
UU (psf)	Unconsolidated Undrained Triaxial Strength
w%	Moisture Content
KY RQD	Rock Quality Designation (Kentucky Method)
STD RQD	Rock Quality Designation (Standard Method)
SDI(JS)	Slake Durability Index (Jar Slake Test)
REC	Core Recovery
φ	Angle of Internal Friction (Total Stress)
$\overline{\mathbf{\phi}}$	Angle of Internal Friction (Effective Stress)
c (psf)	Cohesion (Total Stress)
<u>c</u> (psf)	Cohesion (Effective Stress)
γ (pcf)	Total Unit Weight
RDZ	Rock Disintegration Zone
OB	Overburden Bench
IB	Intermediate Bench
R	Refusal
NR	Refusal Not Encountered



LIMESTONE



TALUS, MINE WASTE, FILL MATERIAL, BOULDERS, & ETC.



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SANDSTONE



DURABLE SHALE (SDI <u>≥</u>95)



DOLOMITE

COAL

LIMESTONE (ARGILLACEOUS)



NONDURABLE SHALE (SDI ≪95)



GRANULAR GRANKMENT		SLOPE PROTECTION					
$ \begin{array}{c} < & \lor \\ > & \land \\ < & \land \\ < & \\ \lor & \end{array} \end{array} $ STRUCTURE GRANULAR BACKFILL							
	ROUTE	ITEM NO. 05-80212.00	COUNTY OF				
GEOTECHNICAL SYMBOL SHEET	US 127	SHEET NO.	drawing number R-001-2024				

1.) IN ACCORDANCE WITH SECTION 206 OF THE CURRENT STANDARD SPECIFICATIONS, THE MOISTURE CONTENT OF EMBANKMENT MATERIAL SHALL NOT VARY FROM THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE CURRENT VERSION OF KM 64-511 BY MORE THAN +2 PERCENT OR LESS THAN -2 PERCENT. THIS MOISTURE CONTENT REQUIREMENT SHALL HAVE EQUAL WEIGHT WITH THE DENSITY REQUIREMENT WHEN DETERMINING THE ACCEPTABILITY OF EMBANKMENT CONSTRUCTION. REFER TO THE FAMILY OF CURVES FOR MOISTURE/DENSITY CORRELATION.

2.) ALL SOILS, WHETHER FROM ROADWAY OR BORROW, MAY REQUIRE MANIPULATION TO OBTAIN PROPER MOISTURE CONTENT PRIOR TO COMPACTION. DIRECT PAYMENT SHALL NOT BE PERMITTED FOR REHANDLING, HAULING, STOCKPILING, AND/OR MANIPULATING SOILS.

3.) EXCAVATION OF SURFACE DITCHES AND CHANNEL CHANGES ADJACENT TO EMBANKMENT AREAS SHALL BE PERFORMED PRIOR TO THE PLACEMENT OF THE ADJACENT EMBANKMENTS. THE MATERIAL EXCAVATED FOR THE CHANNEL CHANGES AND SURFACE DITCHES IS SUITABLE FOR EMBANKMENT CONSTRUCTION IF DRIED TO PROPER MOISTURE CONTENT IN ACCORDANCE WITH SECTION 206 OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

4.) THE CONTRACTOR IS RESPONSIBLE FOR CONDUCTING ANY OPERATIONS NECESSARY TO EXCAVATE THE CUT AREAS TO THE REQUIRED TYPICAL SECTION. THESE OPERATIONS SHALL BE INCIDENTAL TO ROADWAY EXCAVATION OR EMBANKMENT-IN-PLACE AND NO ADDITIONAL COMPENSATION SHALL BE MADE FOR THIS WORK.

5.) SOME OF THE SOIL HORIZONS AND SLOPES ON THE PROJECT ARE SUBJECT TO EROSION. NECESSARY PROCEDURES IN ACCORDANCE WITH SECTIONS 212 AND 213 OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SHALL BE FOLLOWED ON CONSTRUCTION.

6.) REMOVAL OF EXISTING STRUCTURES AND OTHER OBSTRUCTIONS SHALL BE COMPLETED IN ACCORDANCE WITH SECTION 203 OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

7.) CLEARING AND GRUBBING OF ROADWAY AREAS SHALL BE COMPLETED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 202 OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION BEFORE EMBANKMENT PLACEMENT.

8.) BORROW MATERIAL, IF REQUIRED FOR SUBGRADE, SHALL MEET THE MINIMUM CBR VALUE OF 3.

9.) FOUNDATION EMBANKMENT BENCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD DRAWING RGX-010 AT THE LOCATIONS LISTED BELOW AND/OR AS DIRECTED BY THE ENGINEER. CONTRARY TO STANDARD DRAWING RGX-010, THE TYPICAL RISE HEIGHT FOR BENCHING INTO SOIL/EARTH SLOPES SHALL BE 4 TO 6 FEET. BENCHES IN SOIL/EARTH SLOPES SHALL BE CONSTRUCTED ONE AT A TIME BEGINNING WITH THE LOWEST BENCH AND EACH BENCH SHALL BE BACKFILLED PRIOR TO EXCAVATION OF THE NEXT BENCH.

118+75 TO 123+00, RIGHT

RAMP G

STATION 18+75 TO 19+75, LEFT STATION 24+75 TO 26+75, BOTH SIDES

10.) IF GROUNDWATER IS ENCOUNTERED DURING CONSTRUCTION OF EMBANKMENT BENCHES, CONSTRUCT A TRENCH UNDERDRAIN IN ACCORDANCE WITH STANDARD DRAWING RDP-006 DETAIL B, EXCEPT THE TRENCH SHALL HAVE A MINIMUM 2 FT. X 2 FT. CROSS-SECTION AND SHALL BE PLACED IN BOTH SOIL OR BEDROCK BENCHES. THE TRENCH BACKFILL SHALL CONSIST OF KENTUCKY COARSE AGGREGATE NO. 2 IN ACCORDANCE WITH SECTION 805 OF THE CURRENT STANDARD SPECIFICATIONS OR OTHER DURABLE, NON-ERODIBLE MATERIAL DEEMED SUITABLE BY THE ENGINEER. THE ROCK TRENCH SHALL BE GRADED TO ALLOW FOR POSITIVE DRAINAGE. THE ROCK TRENCH SHALL BE WRAPPED IN FABRIC-GEOTEXTILE CLASS 2 (SUBSURFACE DRAINAGE) IN ACCORDANCE WITH SECTIONS 214 AND 843 OF THE CURRENT STANDARD SPECIFICATIONS. CONTRARY TO STANDARD DRAWING RDP-006, OUTLET UNDERDRAINS (PERPENDICULAR TO THE ROADWAY) SHALL FOLLOW DETAIL B WITH THE SAME BACKFILL AND FABRIC MATERIALS GIVEN ABOVE. SPACING OF OUTLET UNDERDRAINS SHALL BE APPROXIMATELY 300 FT ALONG THE ROADWAY, OR AS DIRECTED BY THE ENGINEER.

11.) PERFORATED PIPE FOR SUBGRADE DRAINAGE SHALL BE PLACED IN VERTICAL SAGS AND CUT TO FILL TRANSITIONS IN ACCORDANCE WITH KY STANDARD DRAWING RDP-005 AT THE FOLLOWING APPROXIMATE LOCATIONS AND/OR WHERE DESIGNATED BY THE ENGINEER.

RAMP G STATION 26+78

RAMP_FE STATION 22+57

12.) TRANSVERSE BENCHING SHALL BE INSTALLED AT THE FOLLOWING APPROXIMATE LOCATIONS IN ACCORDANCE WITH STANDARD DRAWING RDP-006 AND ANY OTHERS DESIGNATED BY THE ENGINEER.

RAMP G STATION 24+80 TO 26+78

13.) IN AREAS WHERE PAVEMENT IS NOT TO BE OVERLAID, EXISTING BITUMINOUS CONCRETE LOCATED AT A DISTANCE LESS THAN THREE FEET BELOW THE PROPOSED SUBGRADE ELEVATION WITHIN THE LIMITS OF NEW ROADWAY EMBANKMENTS, SHALL BE REMOVED ENTIRELY. THIS SHALL BE PERFORMED IN COMPLIANCE WITH SECTION 206 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

14.) AS DIRECTED BY THE ENGINEER, EXISTING BITUMINOUS CONCRETE LOCATED AT A DISTANCE GREATER THAN THREE FEET BELOW THE PROPOSED SUBGRADE ELEVATION WITHIN THE LIMITS OF NEW ROADWAY EMBANKMENTS, SHALL BE SCARIFIED OR BROKEN UNTIL ALL CLEAVAGE PLANES ARE DESTROYED, OR THE PAVEMENT SHALL BE REMOVED ENTIRELY AS CONDITIONS DEMAND. THIS SHALL BE PERFORMED IN COMPLIANCE WITH SECTION 206 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

15.) IN ORDER TO PROVIDE A WORKING PLATFORM FOR EMBANKMENT CONSTRUCTION, NON-ERODIBLE GRANULAR EMBANKMENT IN ACCORDANCE WITH THE CURRENT EDITION OF SECTION 805 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SHALL BE PLACED OVER ALL SOFT AND/OR SATURATED AREAS THAT MAY BE DETECTED DURING CONSTRUCTION, AS DIRECTED BY THE ENGINEER. THE REQUIRED THICKNESS IS ESTIMATED TO BE 2 FOOT, BUT THE ACTUAL LOCATIONS AND THICKNESS SHALL BE DETERMINED BY THE ENGINEER DURING CONSTRUCTION AND MAY DEPEND ON SEASONAL FLUCTUATIONS IN THE WATER TABLE. THIS MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC CLASS 2 (SEPARATION) IN ACCORDANCE WITH SECTIONS 214 AND 843 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.

16.) CONSTRUCT A MECHANICALLY STABILIZED ROADBED USING 6 INCHES OF AGGREGATE BASE (DGA OR CSB) UNDERLAIN WITH HIGH STRENGTH GEOTEXTILE FABRIC CLASS 1A BETWEEN THE AGGREGATE AND THE SOIL SUBGRADE. WHERE SOFT AND/OR WET SUBGRADE IS ENCOUNTERED DURING CONSTRUCTION, THE THICKNESS OF THE STABILIZATION MAY BE INCREASED OR A 2-FOOT WORKING PLATFORM CONSISTING OF KENTUCKY COARSE AGGREGATE NO. 2'S, 3'S, OR 23'S UNDERLAIN WITH CLASS 1 GEOTEXTILE FABRIC (STABILIZATION). THESE ADJUSTMENTS SHALL BE AS DIRECTED BY THE ENGINEER.

17.) WHERE DURABLE ROCK IS ENCOUNTERED AT THE TOP OF SUBGRADE, THE BEDROCK SHOULD BE UNDERCUT TO ACCOMMODATE THE 6 INCHES OF MECHANICAL STABILIZATION.



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CABINET	

REVISION

GEOTECHNICAL NOTES

DATE	PREPARED BY	DATE [.]	CHECKED BY		ROUTE	ITEM NO.	COUNTY OF
	Division of Structural Design					05-80212.00	FRANKLIN
	Division of Structural Design	DESIGNED BY:			110 107		
	Geotechnical Branch	DETAILED BY:		GEOTECHNICAL NOTES SHEET	03 127	SHEET NO.	R-001-2024

	Field	d Drilling and s	Sampling wer	e performed in	March 202	 24.	
	Deta	ailed data and	interpretatior	of subsurface	conditions	<i>c</i> 11	
	encou Soil ar	ntered in indiv nd rock strata	vidual borings descriptions	are shown on and indicated b	the soil pro ooundaries	₁file. are	
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	betwe	en borings an	d samples.)	
	indicat	ted on the soil	l profile are as	s recorded at th	ne time of		
	may v	ary considera	ble with time,	according to the	ne prevailing	g ant	
	on the	duration of a	nd methods u	ised in the exp	loration prog	gram.	
	at the	Division of St	ructural Desig	in Frankfort	and are ave	ailable esign	
790	Geote	chnical Branc	h for availabil	ity information	and to sche	esign, edule	
780	SAMPLE	NO.					2
780	STATION					27+50	27+
	OFFSET DEPTH					10.0' Rt. 0.0-5.0	462.8
770		GR	AVEL (-3" + N	IO. 10)		37	1
	COMPOS TOTAL S	SAMPLE SIL	<u>ND (-NO. 10 </u> T (- 0.075 mn	<u>+ NO. 200)</u> n + 0.002 mm)		<u>21</u> 26	32
700			AY (- 0.002 m	m)		16	20
760	PLASTIC I	IMIT				<u> </u>	18
	PLASTICI					15	14
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COMMONWE	ALTH OF KEN	TUCKY	K				
DEPARIM	ENT OF HIGHWAY	3	KENTUCKY TRANSPORTATION CABINET				

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Image: Second											
			NOTICE - Without regard	d to the materials encountered, a	II roadway						
			and drainage excavation as Roadway Excavation.	shall be unclassified and shall b It shall be distinctly understood	e designated that any						
Bedreit Russien Second Russien Control			reference to rock, earth c sections whether in num	or any other materials on the plar bers, words, letters, or lines, is s	ns or cross olely for the						
Number Number<			Department's information classified excavation or t	n and is not to be taken as an ind he quantity of either rock, earth o	ication of or any other						
Bit Description Bit Descri			material involved. The bidder must d	raw his own conclusions as to th	e conditions			A	SPHALT DGA/CSB		
addition in a ware in the observed of a ware in			to be encountered. The to the accuracy of the da	Department does not give any gi ta and no claim will be considere	uarantee as		BORING NO. STAT 9 15+	TION OFFSET THIC +00 8' RT	KNESS (FT) THICKNESS (FT) 1.3 0.5	SUBGRADE SOIL Bedrock	
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All of the second sec	.)		31.02	1 18+00.00							
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NR REFER TO GEOTECHNICAL NOTE 9 FOR 5TA 18-75 STA 10+00 TO 30+44.61 SCALE: 1*= 100 HORIZON TAL 1*= 107 HORIZON T			2.5 GROUNT	-0.08 N=26 A-2-6	(0), GC, S+C=25(18+7)						730
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MIE OPEORED BY Date OPEORED BY STA 10+00 TO 30+44.61 MOUTE COUNTY OF SERVICE COUNTY			REFER TO GE	OTECHNICAL NOTE 9 FOR ST	A 18+75 to 19+75, LEFT SIDE						700
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Division of Structural Design Geotechnical Branch Division of Structural Design Designed BY: Designed BY: STA 10+00 TO 30+44.61 Notife 05-80212.00 FRANKLIN Designed BY: Detailed BY: <td< td=""><td></td><td>ATE</td><td>PREPAR</td><td>ED BY</td><td>DATE</td><td></td><td></td><td></td><td></td><td></td><td>COUNTY OF</td></td<>		ATE	PREPAR	ED BY	DATE						COUNTY OF
Geotechnical Branch Detailed BY: CAWLE OF CONSERVING NOMBER R-001-2024			Division of Struct	ural Design	DESIGNED BY:		STA	a 10+00 IO 30+44.6	51		
			Geotechnica	al Branch	DETAILED BY:			SOIL PROFILE			R-001-2024

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								CLAY (- 0.002 mi	m)	
							PLASTIC LIMIT			
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		DEPARTME	ENT OF HIGHWA	AYS	KENTUCKY TRANSPORTATION CARINET					G
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10 20+83.00 CL	4 24+00.00 215	EX GROUND
 MAXIMUM DRY DENSITY (PCF) OPTIMUM MOISTURE (%) % +4.75mm MATERIAL IN MOISTURE-E	105           20           DENSITY TESTS	
 PLASTICITY INDEX         SPECIFIC GRAVITY         ACTIVITY INDEX         AASHTO CLASSIFICATION         UNIFIED CLASSIFICATION         RESILIENT MODULUS (PSI)	20       0.51       2.54       A-7-6(19)       CL       9400	
OFFSET DEPTH COMPOSITION OF GRAVEL (-3" + NO. COMPOSITION OF SAND (-NO. 10 + NO. TOTAL SAMPLE SILT (- 0.075 mm + 10) CLAY (- 0.002 mm) LIQUID LIMIT PLASTIC LIMIT	5.0' Lt. 0.0-1.7 10) 7 0. 200) 8 0.002 mm) 45 40 40 26	BORING NO 10
SAMPLE NO. STATION	3 24+00	

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		L	ONG TEF	RM	В	1.5						
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		R(73	1.3')			<u>,</u>	SCAI	E: 1" = 10' I	HORIZONT	AL		
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STA	23+00	) & 26+(	 )0					ROUTE		10. 2 00		
							R	AMP G	SHEET	<b>∠.UU</b> NO.		
BANKIVIENT STABILITY SECTION							•	R-001-2024			-2024	

#### COORDINATE DATA SUBMISSION FORM KYTC DIVISION OF STRUCTURAL DESIGN -- GEOTECHNICAL BRANCH

County Franklin										
Road Number										
Survey Crew / Consultant Qk4, Inc.										
Contact Person										
Item-#5-80212										
Mars#										
Proje <del>ct #</del>										

Date 3/4/2024

Notes:			

#### Elevation Datum = NAVD88(Geoid18)

HOLE	LATITUDE	LONGITUDE	HOLE	STATION	OFFSET	ELEVATION (ft)	
NUMBER	(Decimal Degrees)	(Decimal Degrees)	NUMBER				
1	38.15859	-84.89063	1	18+00.00	30	731.6	Ramp G
2	38.15952	-84.89338	2	27+50.00	10	780.4	Ramp G
3	38.16083	-84.89461	3	22+00.00	-49	747.3	Ramp FF
4	38.16053	-84.89516	4	24+00.00	-5	763.6	Ramp FF
5	38.15865	-84.89237	5	23+00.00	-5	736.7	Ramp G
6	38.15887	-84.89228	6	23+00.00	80	734.7	Ramp G
7	38.15911	-84.89325	7	26+00.00	-20	778.4	Ramp G
8	38.15926	-84.89296	8	26+00.00	80	751.2	Ramp G
9	38.15846	-84.8896	9	15+00.00	8	722.5	Ramp G
10	38.1611	-84.89436	10	20+83.00	0	766.4	Ramp FF
11	38.16028	-84.89222	11	29+35.71	401.88	770.3	Ramp G
12	38.15986	-84.89153	12	21+02.44	462.83	762.4	Ramp G
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